

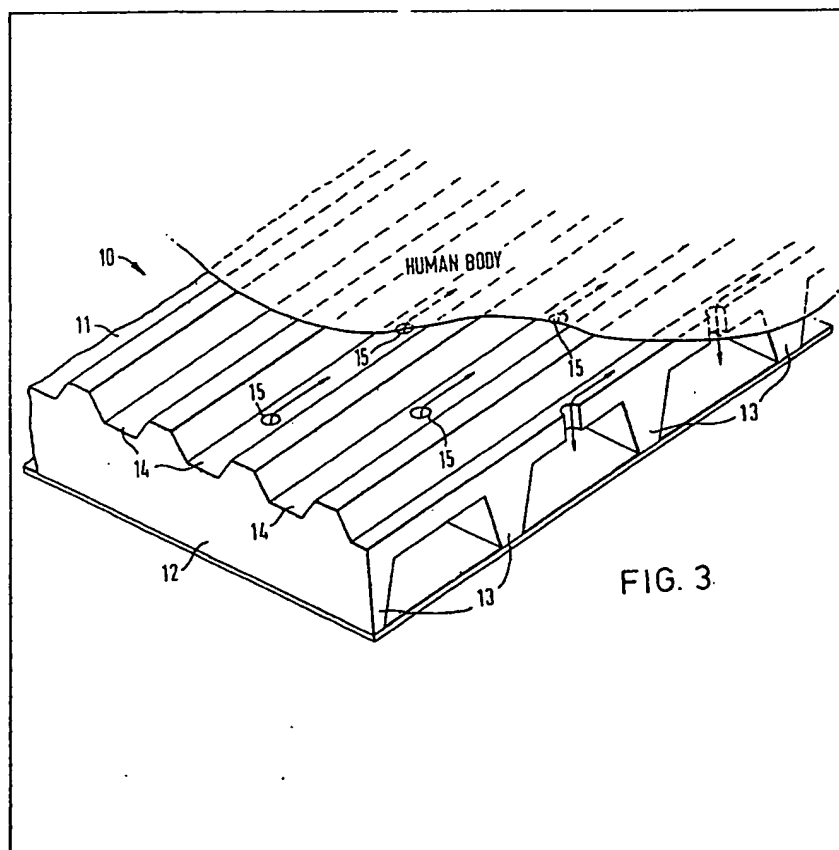
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GB 1532219
GB 1350110
GB 1341325
GB 1334935
GB 1302585
GB 1162896
GB 1030420
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(54) Cushion

(57) A cushion comprises a plain undersheet (12) on which a top sheet (11) is superimposed which has depending ribs (13) to form air passages between the sheets (11) and (12) and is formed in its upper surface with corrugations or indentations (14) in which holes (15) are formed.

All the passages communicate with a duct (not shown) laterally of the cushion which may be connected to means for introducing air into or evacuating it from the cushion.



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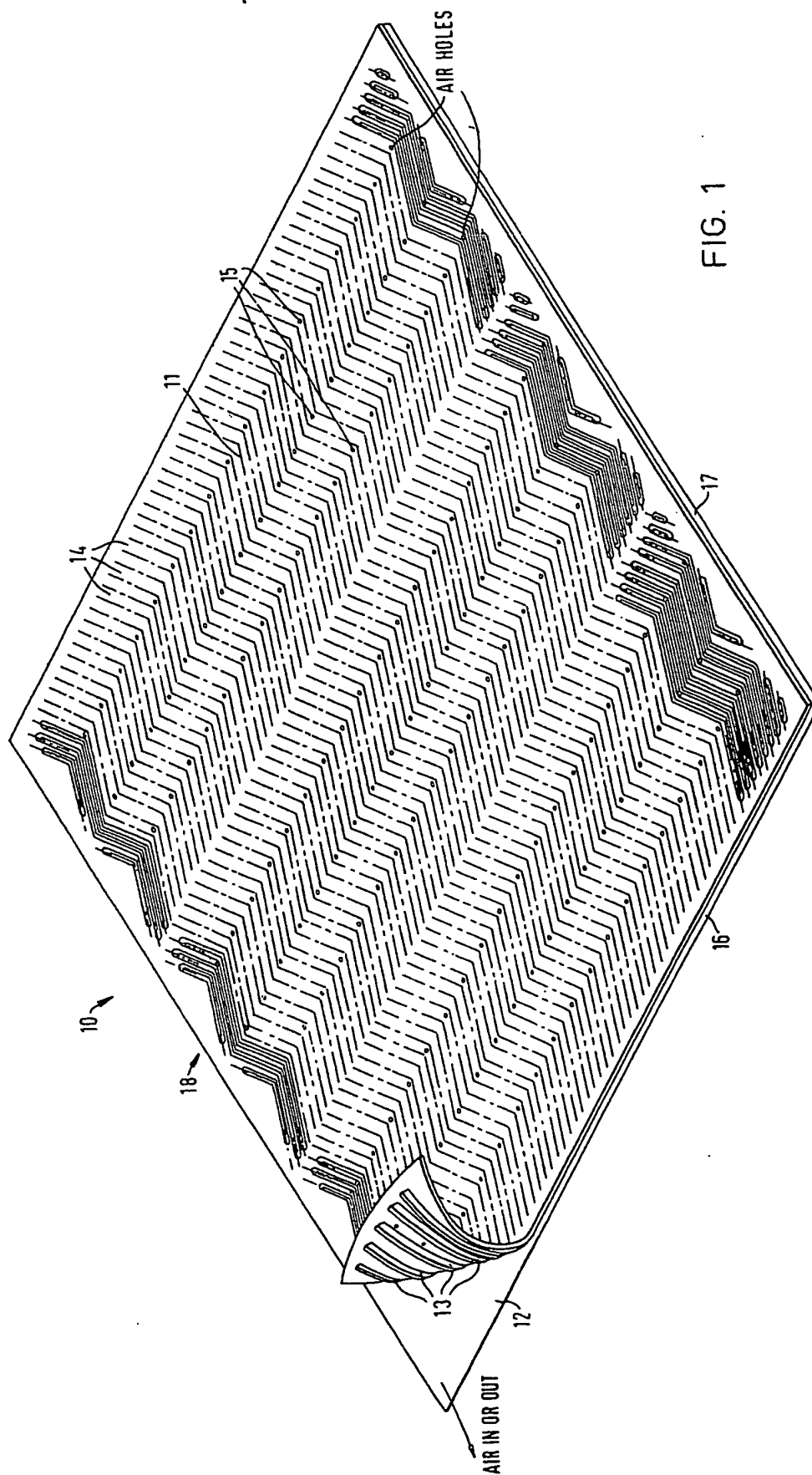
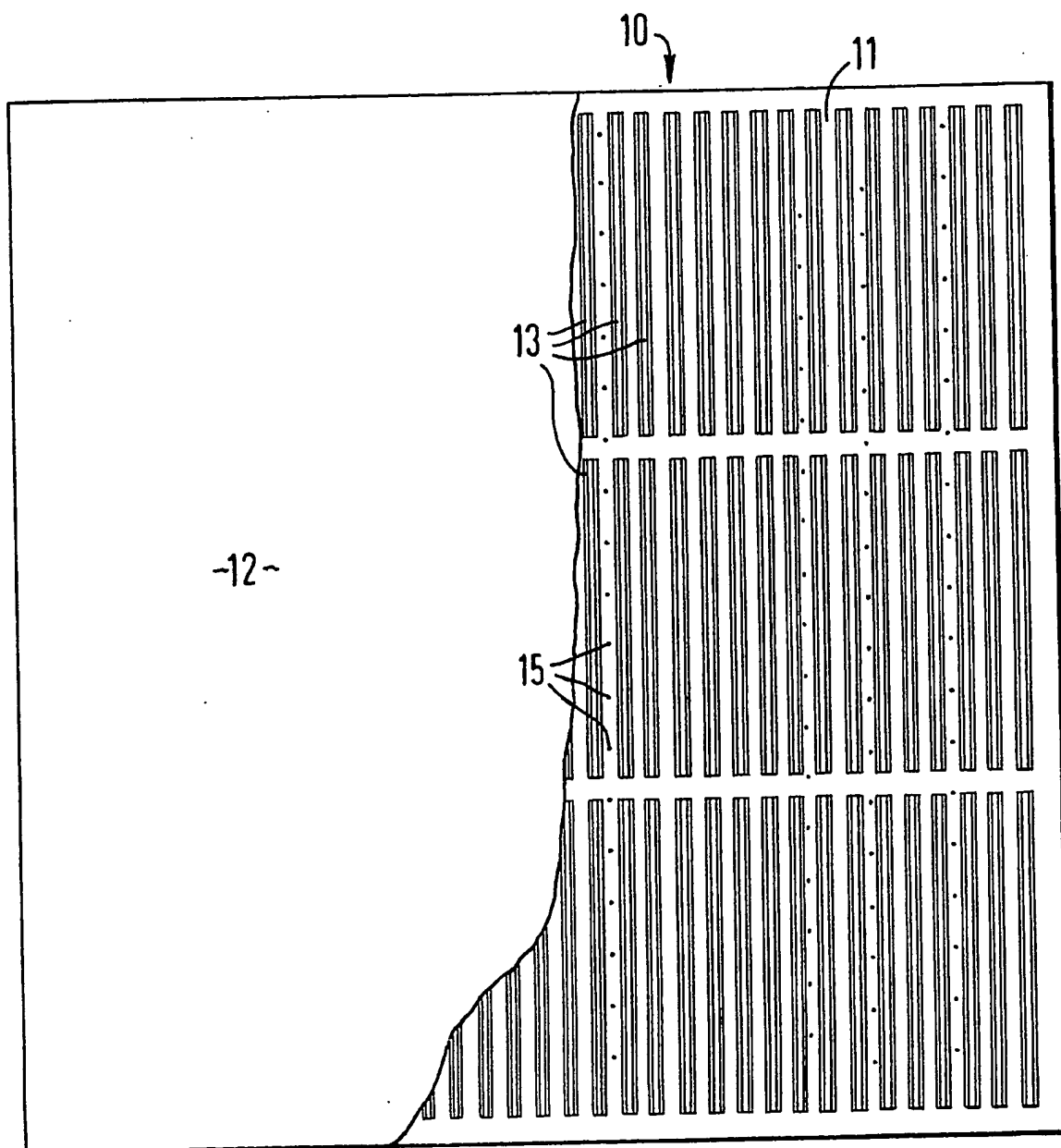


FIG. 1

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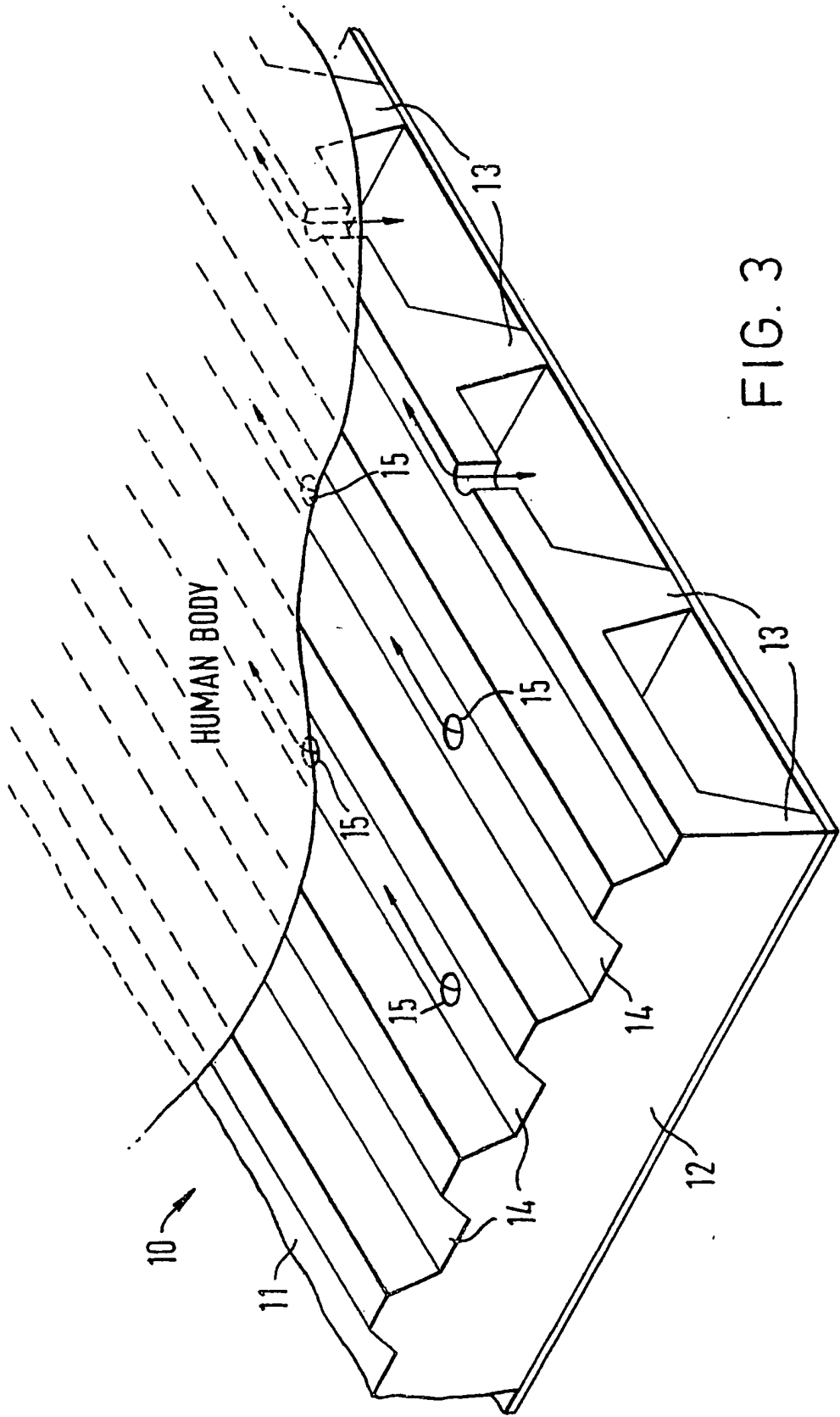


FIG. 3

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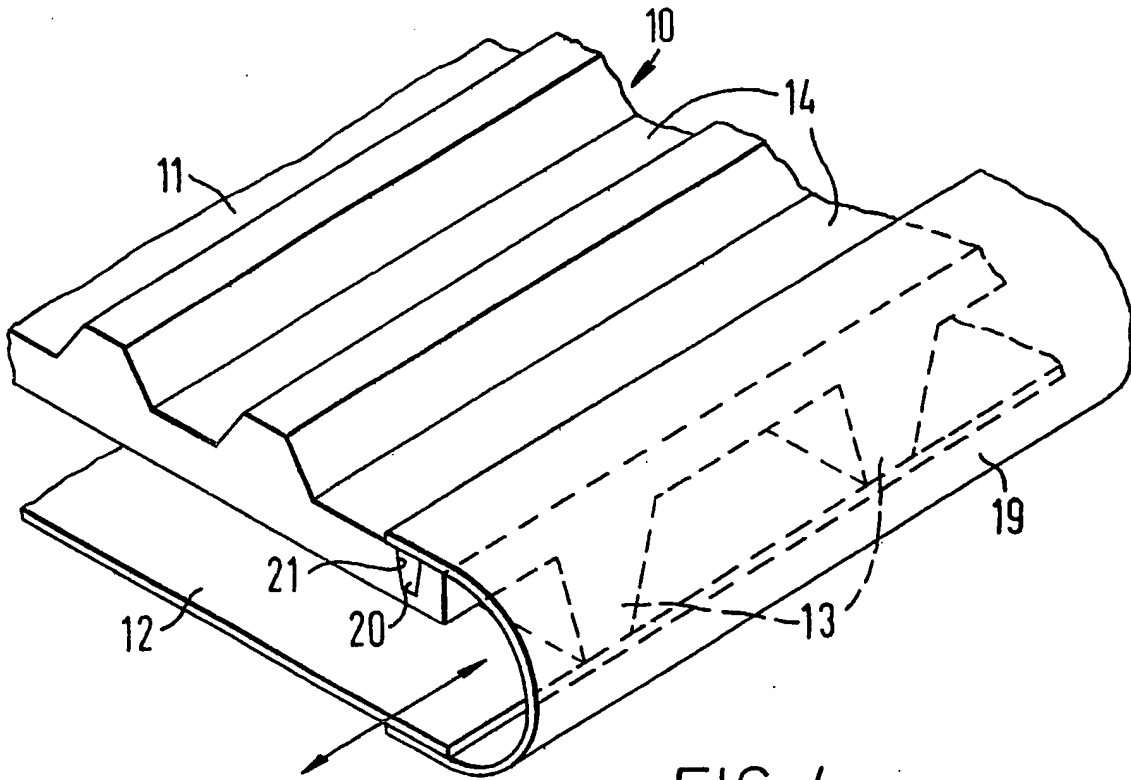


FIG. 4

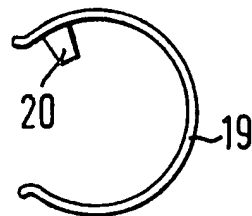


FIG. 5

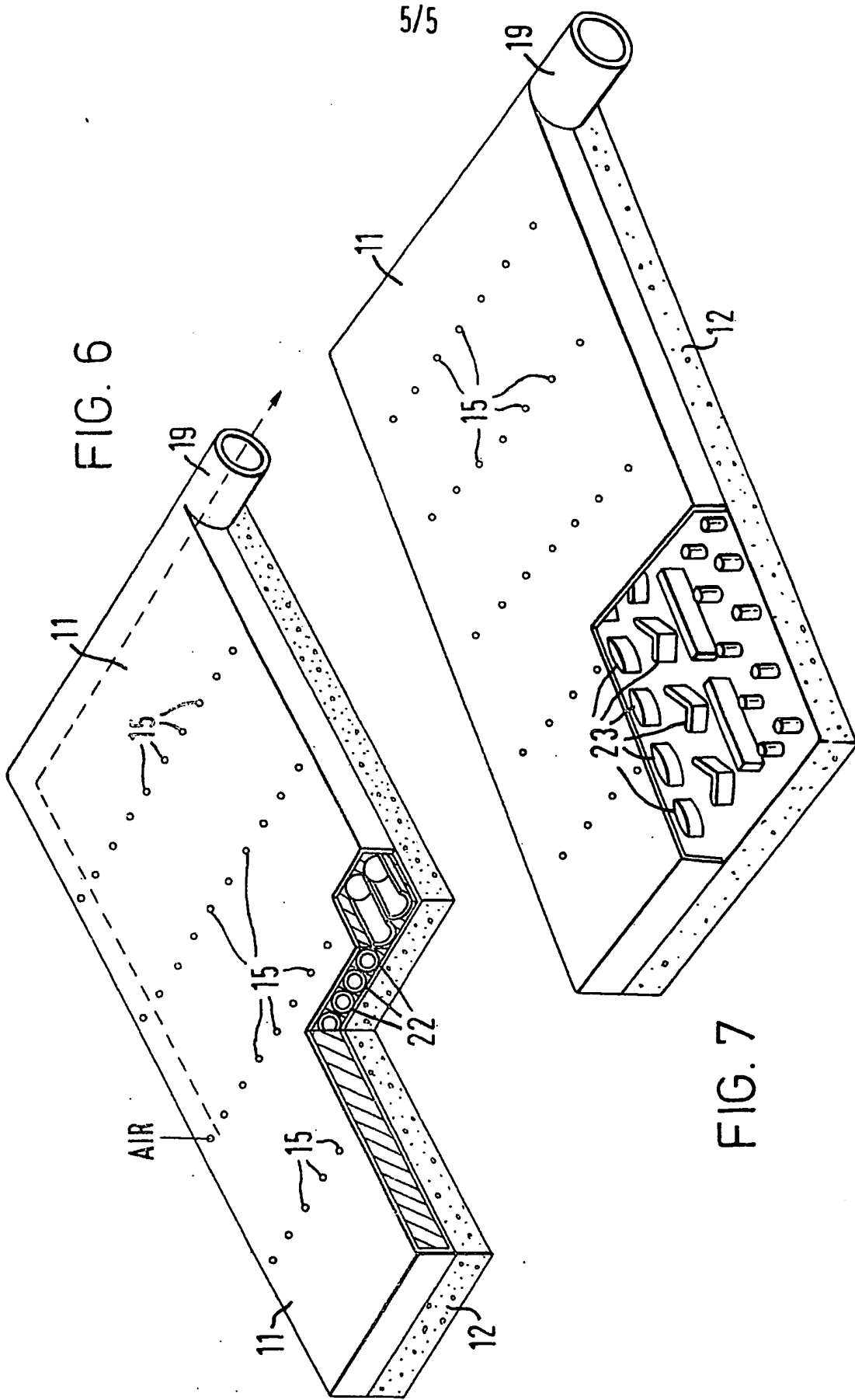


FIG. 7

SPECIFICATION

Cushion

5 This invention relates to a cushion adapted for regulating the temperature and promoting air circulation around the body of a person sitting or lying upon the cushion.

According to the invention there is provided a
10 cushion comprising a lower sheet and a perforated upper sheet supported above the lower sheet by formations which define between the sheets a plurality of passageways all communicating laterally of the cushion with a duct connectable to means for
15 introducing air into or extracting air from said passageways.

Said formations may comprise spaced-apart, elongated ribs on one of said sheets projecting therefrom toward the other sheet, and the upper sheet preferably has a corrugated or indented upper surface, the perforations penetrating the upper sheet in the corrugations or indentations.

The cushion preferably comprises an imperforate lower sheet having substantially flat top and bottom
25 surfaces and an upper sheet which is formed with parallel ribs on its underside, corrugations or indentations in its upper surface and perforations which communicate the upper surface of the upper sheet in the corrugations or indentations therein with the
30 passageways between the upper and lower sheets defined by said ribs. Said corrugations or indentations may define elongated grooves in the upper surface of the upper sheet which are transverse to the passageways defined by said ribs.

Alternatively, said formations may comprise parallel tubes disposed between the upper and lower sheets and having apertured walls to communicate their interiors with the perforations in the upper sheet.

40 The bottom sheet is preferably of soft material such as sponge or foam rubber or synthetic plastics material.

The cushion may be enclosed in an envelope of porous material.

45 In a preferred use of the cushion of the invention said duct is connected to the air conditioning system of a vehicle.

Preferred embodiments of the invention will now be described with reference to the accompanying
50 drawings, in which:-

Figure 1 is a perspective view from above of a cushion assembly in accordance with the invention,

Figure 2 is an underplan view of the assembly of *Figure 1* with the bottom sheet partially removed to
55 expose the underside of the top sheet,

Figure 3 is an isometric representation of the assembly of *Figures 1* and *2* with parts enlarged and not to scale to illustrate their relationship more clearly,

60 *Figure 4* is a view similar to *Figure 3* showing the attachment to one side of the assembly of an air duct,

Figure 5 shows the means defining the air duct in cross-section, and

65 *Figures 6 and 7* show modified forms of the

cushion of the invention in perspective and partly broken away.

The cushion 10 illustrated in *Figures 1* to *5* comprises an upper sheet 11 superimposed on a
70 bottom sheet 12. The bottom sheet 12 is plain, having flat top and bottom surfaces, and is preferably of a soft material such as sponge or foam rubber or synthetic plastics material. The upper sheet 11 is, on the contrary, formed with parallel,
75 elongated ribs 13 of trapezium cross-section which extend downwardly from its underside and with grooves or corrugations 14 in its upper surface. The corrugations 14 are distributed across the upper surface of the sheet 11 in a series of chevron
80 formations transverse to the straight ribs 13, none of the latter extending the full width of the sheet 11 so that the passageways defined by the ribs 13 between the sheets 11 and 12 intercommunicate at various positions including the edges of the sheets.

85 Small perforations 15 penetrate the upper sheet 11 in the bottoms of the corrugations 14, placing the upper surface of the cushion in communication with the passageways defined by the ribs 13.

The two sheets 11 and 12 are joined around their edges by walls such as 16 and 17 except on one side 18 of the cushion where they are connected by a C-section member 19, not shown in *Figures 1* to *3*, which defines with the sheets 11 and 12 a lateral air duct in communication with the holes 15 via the
95 passageways formed by the ribs 13. As shown in *Figures 4* and *5* the member 19 may have a tooth 20 which is a friction fit in a groove 21 provided therefor in the upper sheet 11 and 12 by a suitable adhesive.

One end of the member 19 is formed as a suitable
100 coupling (not shown) whereby it may be connected to means for introducing air into or removing air from the interior of the cushion.

The cushion is preferably finished by enclosing or upholstering it in an air-pervious or porous cover
105 (not shown).

By means of the cushion of the invention air may be circulated around a person sitting or lying on it (see *Figure 3*) to increase his comfort, e.g. by removing perspiration in hot conditions or by blowing warm air in cold conditions. A preferred use of the cushion is in a vehicle, such as a road vehicle, or air or marine craft, the duct 19 being connected to an air conditioning system, or at least a source of warm or cool air, of the vehicle.

115 It will be appreciated that the design lay-out and distribution of the grooves or corrugations 14 in the upper surface of the upper sheet 11 is exemplary only and these may take a wide variety of forms according to choice. They need not be elongated or transverse to the ribs 13. For example the upper
120 surface of the upper sheet 11 may be embossed with discrete projections, the holes 15 lying in the thinner areas of the sheet between the projections.

Furthermore, the passageways in the interior of the cushion need not be provided by ribs on the upper sheet, but any suitable partition means may be used to subdivide the space between the sheets. *Figures 6* and *7* show examples of alternative construction. In *Figure 6* the top and bottom sheets
125 11 and 12 have disposed between them a layer of

side-by-side tubes 22 the walls of which are formed with apertures (not shown) to communicate their interiors with the holes 15 in the upper sheet 11, all the tubes 22 communicating at one of their respective ends with a duct 19 whereby air is conveyed into or out of the cushion. The tubes 22 may be separated by strips (not shown) of air-pervious material such as sponge rubber.

In the embodiment of Figure 7 the passageways in the interior of the cushion are formed by the spaces between discrete spacing elements 23 located between the top and bottom sheets.

CLAIMS

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1. A cushion comprising a lower sheet and a perforated upper sheet supported above the lower sheet by formations which define between the sheets a plurality of passageways all communicating laterally of the cushion with a duct connectable to means for introducing air into or extracting air from said passageways.

2. A cushion as claimed in claim 1, wherein said formations comprise spaced-apart, elongated ribs on one of said sheets projecting therefrom toward the other sheet.

3. A cushion as claimed in either preceding claim, wherein the upper sheet has a corrugated or indented upper surface, the perforations penetrating the upper sheet in the corrugations or indentations.

4. A cushion as claimed in any one of the preceding claims, comprising an imperforate lower sheet having substantially flat top and bottom surfaces and an upper sheet which is formed with parallel ribs on its underside, corrugations or indentations in its upper surface and perforations which communicate the upper surface of the upper sheet in the corrugations or indentations therein with the passageways between the upper and lower sheets defined by said ribs.

5. A cushion as claimed in claim 4, wherein said corrugations or indentations define elongated grooves in the upper surface of the upper sheet which are transverse to the passageways defined by said ribs.

6. A cushion as claimed in claim 1, wherein said formations comprise parallel tubes disposed between the upper and lower sheets and having apertured walls to communicate their interiors with the perforations in the upper sheet.

7. A cushion as claimed in any one of the preceding claims, wherein the bottom sheet is of soft material such as sponge or foam rubber or synthetic plastics material.

8. A cushion as claimed in any one of the preceding claims enclosed in an envelope of porous material.

9. A cushion as claimed in any one of the preceding claims when said duct is connected to the air conditioning system of a vehicle.

10. A cushion substantially as herein described with reference to and as shown in Figures 1 to 5 or Figure 6 or Figure 7 of the accompanying drawings.